

**UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK**

In re:	:	Chapter 11
	:	
AEREO, INC.,	:	Case No. 14-13200 (SHL)
	:	
Debtor.	:	

**DECLARATION OF JOSEPH LIPOWSKI IN SUPPORT OF
DEBTOR’S RESPONSE AND OPPOSITION TO THE BROADCASTERS’ MOTION TO
STAY OR OJECTION TO BIDDING PROCEDURES MOTION**

I, Joseph Lipowski, declare under the penalties of perjury:

1. I make this declaration in support of the Debtor’s Response and Opposition to the Broadcasters’ Motion to Stay or Objection to Bidding Procedures Motion, filed with this Declaration. This declaration is based on my personal knowledge and belief. I am an individual who is over 18 years of age.

2. I am the Chief Technology Officer (“CTO”) of Aereo, Inc. (the “Debtor”). As Chief Technology Officer, I was a principal responsible for the design and implementation of the Aereo technology (the “Aereo Technology”). Prior to the Supreme Court’s ruling in June 2014, Aereo offered the Aereo Technology as a consumer product to enable users to make individual recordings of and view over-the-air television broadcasts accessed through an individually assigned antenna.

3. I have a Bachelor’s Degree in Electrical Engineering from the Massachusetts Institute of Technology (SBEE 1979) and a Master’s Degree in Electrical Engineering from the University of Michigan (MSEE 1980). For more than 30 years I have worked in industry as an engineer, with a particular emphasis on Radio Frequency (“RF”) systems and RF components including antennas. My work has focused heavily on the transmission and reception of wireless

signals through the air and outer space—for example, cellular telephone technology and satellite technology. My work almost always has involved the hardware and software necessary to transmit, receive, decode, process, and store wireless signals. During my career I have worked for many companies in these fields, including M/A-COM (as Engineer and Group Leader), Pacific Communications Sciences, Inc. (as Director of Technology), Lucent Technologies, Inc. (as Director of RF Hardware Development), Celiant Corporation (as Chief Technology Officer), Andrew Corporation (as Vice President of Research), and LoJack Corporation (as Senior Vice President of Engineering).

Description of the Aereo Technology

4. I joined Bamboo Entertainment Corporation, which later became Bamboom Labs, Inc., and then Aereo, Inc., in October 2010. As Aereo's CTO, I was responsible for the design, development, operation, and maintenance of the hardware and much of the software that allowed the Aereo system to function.

5. In general terms, the Aereo system was a technology platform that enabled users to make individual recordings of over-the-air television broadcasts accessed through an individually assigned antenna. Essentially, it provided consumers with the ability to remotely locate their antenna and digital video recorder ("DVR"). The recordings, which were accessible only to the user who made them, were stored on a remote-storage DVR ("RS-DVR"). While the system was certainly electronically complicated (as is a conventional DVR or any computer component), it was designed to be simple from a consumer's point of view. When a consumer pushed play on a conventional DVR, there is complex machinery and software that automatically responds to that command. The same was true with the Aereo system.

6. The Aereo RS-DVR could also be used independent of the remote antenna feature. For example, beginning on December 13, 2012, Aereo offered access to the Bloomberg channel which was delivered by Bloomberg to Aereo through a licensed direct feed, and not as an over-the-air broadcast. Apart from the fact that consumers did not access Bloomberg via remote antenna, all other aspects of Bloomberg access and playback were the same as for over-the-air broadcast. No one has ever alleged copyright infringement in connection with the availability of the Bloomberg channel.

7. Consumers accessed Aereo over the Internet through an HTML browser interface using a traditional computer or laptop, tablet, or mobile phone, by going to Aereo.com. Alternatively, consumers could access Aereo from an Android native application or a Roku application, but the functionality was identical to that of the HTML browser. As with a conventional DVR, a user could choose to begin playback of her recording immediately after the broadcast data was recorded, or the user could choose to save her recording until she decided to play it back at a later time.

The Details of the Aereo System

8. At a high level, the Aereo system consisted of antennas and a series of hard drives and computer servers that acted as a DVR. The system's operation was controlled by the user and enabled by computer software. At the user end, there was a website interface or application that the Aereo customer used to control this machinery, including a channel and program guide and a menu of options for scheduling a future recording or for recording and playing a program that was currently airing.

9. When a user selected a program that is available over-the-air from the guide and chose to record that program, the Aereo system began the automatic process of assigning an

individual antenna to the user and tuning to the channel selected by the user. The antennas were connected to individual electronic components and mounted on an “Antenna Board” in pairs (one VHF and one UHF). An antenna element pair, along with their associated circuitry, comprised one Aereo antenna. If the user selected a program that did not originate from an over-the-air broadcast, such as the Bloomberg channel, a user-assigned antenna was not used to receive the program because the channel was delivered to the Aereo system through a direct feed provided by Bloomberg.

10. The signal received by the user’s antenna passed through a tuner and was automatically sent to a demodulator which removed the information bearing signal from the non-information bearing carrier wave and converted that signal into its digital MPEG-2 multi-program transport stream.

11. From there, the transport stream was sent to a transcoder. The transcoder reformatted and compressed the information so that it was more easily recorded and was more compatible with the user’s ability to pull the stream through the Internet. Through this process, and throughout the entire Aereo system, each user’s signal remained unique to that user and was exclusively associated with that user.

12. Once transcoded, the information, which was identified exclusively with a particular user, was recorded by the user to a hard drive where it could be retrieved and played back by the user either immediately after recording or at a later time. When the user initiated playback by selecting the recording on the user interface and pressing play, the “Media Manager” would act automatically to find that user’s unique recording, and the “Streaming Server” would stream it to the user from the hard drive in response to the user’s request.

13. The user viewed the playback of the recording through a media player in the user's web-browser, on the Android device, or using Roku on a TV monitor.

Alternative Uses of the Aereo System

14. The Aereo system had three main functional components: (a) the antennas that users accessed to obtain the video signals from over-the-air broadcasts; (b) the transcoders to reformat and compress the data; and (c) the remote DVR and streamer that recorded and played back the processed video.

15. There are numerous uses for the Aereo system other than to use the remote antennas for over-the-air broadcasts. For instance, as discussed above, users were able to access the Bloomberg cable television channel through the Aereo system. The Bloomberg channel was ingested into a transcoder and sent to the remote DVR and streamer using a direct licensed feed, not through any remote antennas. The Aereo system could be used to provide access to other licensed cable television channels. In addition, the remote DVR and streamer are capable of recording and streaming video from myriad other video sources as long as the video signal is coded using a standard codec. As such, the transcoders and the remote DVR and streamer could be configured to permit users to access a limitless amount of other video content.

16. Video could also be obtained through live broadcasts from the web cams of members of the public. That video could be ingested into the Aereo system through the Internet rather than through antennas and recorded and accessed through the remote DVR and streamer.

17. The remote DVR and streamer could also be used to stream licensed content, such as movies and television programs, saved on the Aereo system's hard drives. Such a service would be similar in concept to the current service provided by Netflix.

18. If the Aereo system were implemented for one of these uses without the antennas, the antennas could be adapted for other uses, such as to receive radio signals, weather signals, and navigation signals.

19. The Aereo system including the antennas could also be implemented internationally because several other countries, including Canada and Mexico, use the same standard for digital over-the-air broadcasts, ATSC, as does the United States. There may also be many other uses for aspects of the Aereo technology which may be conceived and implemented by a buyer of the Aereo technology.

I declare under the penalties of perjury under the laws of the United States of America that the foregoing is true and accurate to the best of my knowledge. Executed this 17th day of December, 2014.

/s/ Joseph Lipowski
Joseph Lipowski